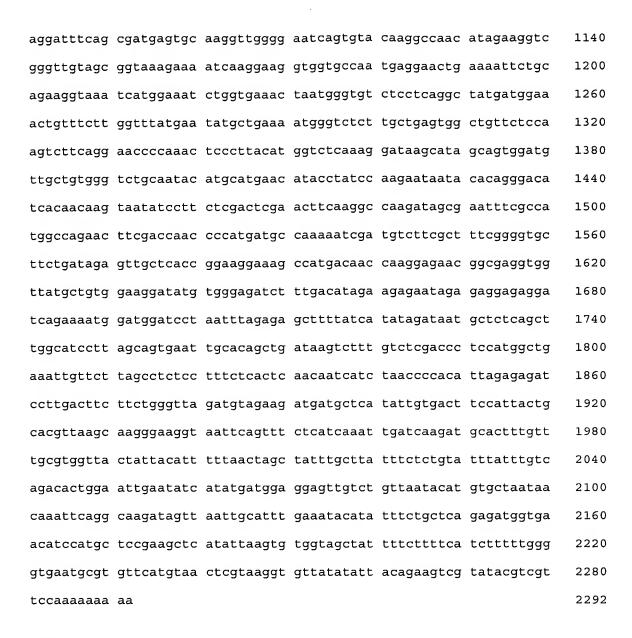SEQUENCE LISTING

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11

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12

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13

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14

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Gly Thr Asn Phe Ser Cys Pro Val Asp Ser Pro Pro Ser Cys Glu Thr
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Tyr Val Thr Tyr Phe Ala Arg Ser Pro Asn Phe Leu Ser Leu Thr Asn
        50                  55                  60

Ile Ser Asp Ile Phe Asp Met Ser Pro Leu Ser Ile Ala Lys Ala Ser
65                  70                  75                  80

Asn Ile Glu Asp Glu Asp Lys Lys Leu Val Glu Gly Gln Val Leu Leu
                85                  90                  95

Ile Pro Val Thr Cys Gly Cys Thr Arg Asn Arg Tyr Phe Ala Asn Phe
            100                 105                 110

Thr Tyr Thr Ile Lys Leu Gly Asp Asn Tyr Phe Ile Val Ser Thr Thr
        115                 120                 125

Ser Tyr Gln Asn Leu Thr Asn Tyr Val Glu Met Glu Asn Phe Asn Pro
    130                 135                 140

Asn Leu Ser Pro Asn Leu Leu Pro Pro Glu Ile Lys Val Val Val Pro
145                 150                 155                 160

Leu Phe Cys Lys Cys Pro Ser Lys Asn Gln Leu Ser Lys Gly Ile Lys
            165                 170                 175

His Leu Ile Thr Tyr Val Trp Gln Ala Asn Asp Asn Val Thr Arg Val
            180                 185                 190

Ser Ser Lys Phe Gly Ala Ser Gln Val Asp Met Phe Thr Glu Asn Asn
    195                 200                 205

Gln Asn Phe Thr Ala Ser Thr Asn Val Pro Ile Leu Ile Pro Val Thr
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Lys Leu Pro Val Ile Asp Gln Pro Ser Ser Asn Gly Arg Lys Asn Ser
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Thr Gln Lys Pro Ala Phe Ile Ile Gly Ile Ser Leu Gly Cys Ala Phe
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15

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Phe Val Val Val Leu Thr Leu Ser Leu Val Tyr Val Tyr Cys Leu Lys
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Leu Leu Ser Gly Val Ser Gly Tyr Val Ser Lys Pro Thr Met Tyr Glu
        290                 295                 300

Met Asp Ala Ile Met Glu Ala Thr Met Asn Leu Ser Glu Asn Cys Lys
305                 310                 315                 320

Ile Gly Glu Ser Val Tyr Lys Ala Asn Ile Asp Gly Arg Val Leu Ala
                325                 330                 335

Val Lys Lys Ile Lys Lys Asp Ala Ser Glu Glu Leu Lys Ile Leu Gln
                340                 345                 350

Lys Val Asn His Gly Asn Leu Val Lys Leu Met Gly Val Ser Ser Asp
        355                 360                 365

Asn Asp Gly Asn Cys Phe Leu Val Tyr Glu Tyr Ala Glu Asn Gly Ser
        370                 375                 380

Leu Asp Glu Trp Leu Phe Ser Glu Ser Ser Lys Thr Ser Asn Ser Val
385                 390                 395                 400

Val Ser Leu Thr Trp Ser Gln Arg Ile Thr Val Ala Val Asp Val Ala
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Val Gly Leu Gln Tyr Met His Glu His Thr Tyr Pro Arg Ile Ile His
                420                 425                 430

Arg Asp Ile Thr Thr Ser Asn Ile Leu Leu Asp Ser Asn Phe Lys Ala
                435                 440                 445

Lys Ile Ala Asn Phe Ser Met Ala Arg Thr Ser Thr Asn Ser Met Met
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Pro Lys Ile Asp Val Phe Ala Phe Gly Val Val Leu Ile Glu Leu Leu
465                 470                 475                 480

Thr Gly Lys Lys Ala Ile Thr Thr Met Glu Asn Gly Glu Val Val Ile
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16

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Glu Ser Leu Arg Lys Trp Met Asp Pro Lys Leu Glu Asn Phe Tyr Pro
        515                 520                 525


Ile Asp Asn Ala Leu Ser Leu Ala Ser Leu Ala Val Asn Cys Thr Ala
    530                 535                 540


Asp Lys Ser Leu Ser Arg Pro Ser Ile Ala Glu Ile Val Leu Cys Leu
545                 550                 555                 560


Ser Leu Leu Asn Gln Ser Ser Ser Glu Pro Met Leu Glu Arg Ser Leu
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Thr Ser Gly Leu Asp Val Glu Ala Thr His Val Val Thr Ser Ile Val
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gaatcaaact gtctgaaggg gtgtgatcta gctttagctt cctattatat cttgcctggt   240

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gccataacca gctacaacaa agacaaaatt ctcaatgata tcaacatcca atcctttcaa   360

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22

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Leu Leu Phe Phe Ile Leu Leu Leu Gly His Val Cys Phe His Val Glu
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24

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Leu Pro Gly Val Phe Ile Leu Gln Asn Ile Thr Thr Phe Met Gln Ser
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gag att gtc tca agt aat gat gcc ata acc agc tac aac aaa gac aaa        4384
Glu Ile Val Ser Ser Asn Asp Ala Ile Thr Ser Tyr Asn Lys Asp Lys
            60              65              70

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Ile Leu Asn Asp Ile Asn Ile Gln Ser Phe Gln Arg Leu Asn Ile Pro
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Phe Pro Cys Asp Cys Ile Gly Gly Glu Phe Leu Gly His Val Phe Glu
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Tyr Ser Ala Ser Lys Gly Asp Thr Tyr Glu Thr Ile Ala Asn Leu Tyr
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Tyr Ala Asn Leu Thr Thr Val Asp Leu Leu Lys Arg Phe Asn Ser Tyr
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Asp Pro Lys Asn Ile Pro Val Asn Ala Lys Val Asn Val Thr Val Asn
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Cys Ser Cys Gly Asn Ser Gln Val Ser Lys Asp Tyr Gly Leu Phe Ile
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acc tat ccc att agg cct ggg gat aca ctg cag gat att gca aac cag        4720
Thr Tyr Pro Ile Arg Pro Gly Asp Thr Leu Gln Asp Ile Ala Asn Gln
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agt agt ctt gat gca ggg ttg ata cag agt ttc aac cca agt gtc aat        4768
Ser Ser Leu Asp Ala Gly Leu Ile Gln Ser Phe Asn Pro Ser Val Asn
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Phe Ser Lys Asp Ser Gly Ile Ala Phe Ile Pro Gly Arg
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                                                 Tyr Lys Asn Gly
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Val Tyr Val Pro Leu Tyr His Arg
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Ser Gly Ala Ala Val Gly Ile Ser Ile Ala Gly Thr Phe Val Leu Leu
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Leu Leu Ala Phe Cys Met Tyr Val Arg Tyr Gln Lys Lys Glu Glu Glu
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Lys Ala Lys Leu Pro Thr Asp Ile Ser Met Ala Leu Ser Thr Gln Asp
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Tyr Glu Thr Ser Gly Ser Ser Gly Pro Gly Thr Ala Ser Ala Thr Gly
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ctt act agc att atg gtg gcg aaa tca atg gag ttc tca tat cag gaa    6588
Leu Thr Ser Ile Met Val Ala Lys Ser Met Glu Phe Ser Tyr Gln Glu
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Leu Ala Lys Ala Thr Asn Asn Phe Ser Leu Asp Asn Lys Ile Gly Gln
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Gly Gly Phe Gly Ala Val Tyr Tyr Ala Glu Leu Arg Gly Lys
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aatgcag aaa aca gca att aag aag atg gat gta caa gca tca aca gaa      7147
        Lys Thr Ala Ile Lys Lys Met Asp Val Gln Ala Ser Thr Glu
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Phe Leu Cys Glu Leu Lys Val Leu Thr His Val His His Leu Asn Leu
360             365                 370                 375

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Leu His Gly Ser
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                                                      Gly Lys Glu Pro
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Leu Pro Trp Ser Ser Arg Val Gln Ile Ala Leu Asp Ala Ala Arg Gly
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Leu Glu Tyr Ile His Glu His Thr Val Pro Val Tyr Ile His Arg Asp
             430                     435                     440

gtg aaa tct gca aac ata ttg ata gat aag aac ttg cgt gga aag          8384
Val Lys Ser Ala Asn Ile Leu Ile Asp Lys Asn Leu Arg Gly Lys
         445                 450                     455

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                                Val Ala Asp Phe Gly Leu Thr Lys Leu
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Ile Glu Val Gly Asn Ser Thr Leu Gln Thr Arg Leu Val Gly Thr Phe
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Gly Tyr Met Pro Pro Asp
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28

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caga t atg ctc aat atg gtg ata ttt ctc caa aaa tag atg tat atg       9180
        Met Leu Asn Met Val Ile Phe Leu Gln Lys     Met Tyr Met
         490                     495                 500

cat ttg gag ttg ttc ttt ttg aac tta ttt ctg caa aga atg ctg ttc     9228
His Leu Glu Leu Phe Phe Leu Asn Leu Phe Leu Gln Arg Met Leu Phe
        505                     510                 515

tga aga cag gtg aat tag ttg ctg aat caa agg gcc ttg tag ctt tg      9275
    Arg Gln Val Asn     Leu Leu Asn Gln Arg Ala Leu     Leu Cys
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cattgcag t ttg aag aag cac tta ata aga gtg atc ctt gtg atg ctc       9443
           Leu Lys Lys His Leu Ile Arg Val Ile Leu Val Met Leu
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Phe Ala Asn Trp Trp Ile Leu Gly Leu Glu Lys Thr Ile Gln Leu Ile
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Leu Phe Ser Arg
560

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accttaatgc tttattgttg tttgagttgc ag a ttg cac aac tag gga gag ctt    9716
                                      Leu His Asn     Gly Glu Leu
                                                      565

gta caa gag ata atc cac tgc taa gac caa gta tga gat ctt tag ttg     9764
Val Gln Glu Ile Ile His Cys     Asp Gln Val     Asp Leu     Leu
570                 575                         580

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Leu Leu Leu     Pro Phe His His Leu Leu Arg Ile Val Met Met Asn
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Leu Pro Thr Lys Val Lys Leu Ser     Ile Tyr Cys Leu     Asp
        600                 605                     610

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29

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His Val Cys Phe His Val Glu Ser Asn Cys Leu Lys Gly Cys Asp Leu
            20   25   30

Ala Leu Ala Ser Tyr Tyr Ile Leu Pro Gly Val Phe Ile Leu Gln Asn
        35   40   45

Ile Thr Thr Phe Met Gln Ser Glu Ile Val Ser Ser Asn Asp Ala Ile
    50   55   60

Thr Ser Tyr Asn Lys Asp Lys Ile Leu Asn Asp Ile Asn Ile Gln Ser
65   70   75   80

Phe Gln Arg Leu Asn Ile Pro Phe Pro Cys Asp Cys Ile Gly Gly Glu
                85   90   95

Phe Leu Gly His Val Phe Glu Tyr Ser Ala Ser Lys Gly Asp Thr Tyr
            100   105   110

Glu Thr Ile Ala Asn Leu Tyr Tyr Ala Asn Leu Thr Thr Val Asp Leu
            115   120   125

Leu Lys Arg Phe Asn Ser Tyr Asp Pro Lys Asn Ile Pro Val Asn Ala
        130   135   140

Lys Val Asn Val Thr Val Asn Cys Ser Cys Gly Asn Ser Gln Val Ser
145   150   155   160

Lys Asp Tyr Gly Leu Phe Ile Thr Tyr Pro Ile Arg Pro Gly Asp Thr
30

Leu Gln Asp Ile Ala Asn Gln Ser Ser Leu Asp Ala Gly Leu Ile Gln
        180   185   190

Ser Phe Asn Pro Ser Val Asn Phe Ser Lys Asp Ser Gly Ile Ala Phe
        195   200   205

Ile Pro Gly Arg Tyr Lys Asn Gly Val Tyr Val Pro Leu Tyr His Arg
    210   215   220

Thr Ala Gly Leu Ala Ser Gly Ala Ala Val Gly Ile Ser Ile Ala Gly
225   230   235   240

Thr Phe Val Leu Leu Leu Leu Ala Phe Cys Met Tyr Val Arg Tyr Gln
            245   250   255

Lys Lys Glu Glu Glu Lys Ala Lys Leu Pro Thr Asp Ile Ser Met Ala
        260   265   270

Leu Ser Thr Gln Asp Ala Ser Ser Ser Ala Glu Tyr Glu Thr Ser Gly
        275   280   285

Ser Ser Gly Pro Gly Thr Ala Ser Ala Thr Gly Leu Thr Ser Ile Met
    290   295   300

Val Ala Lys Ser Met Glu Phe Ser Tyr Gln Glu Leu Ala Lys Ala Thr
305   310   315   320

Asn Asn Phe Ser Leu Asp Asn Lys Ile Gly Gln Gly Gly Phe Gly Ala
            325   330   335

Val Tyr Tyr Ala Glu Leu Arg Gly Lys Lys Thr Ala Ile Lys Lys Met
        340   345   350

Asp Val Gln Ala Ser Thr Glu Phe Leu Cys Glu Leu Lys Val Leu Thr
        355   360   365

His Val His His Leu Asn Leu Val Arg Leu Ile Gly Tyr Cys Val Glu
    370   375   380

Gly Ser Leu Phe Leu Val Tyr Glu His Ile Asp Asn Gly Asn Leu Gly
385   390   395   400

Gln Tyr Leu His Gly Ser Gly Lys Glu Pro Leu Pro Trp Ser Ser Arg

Val Gln Ile Ala Leu Asp Ala Ala Arg Gly Leu Glu Tyr Ile His Glu
        420   425   430

His Thr Val Pro Val Tyr Ile His Arg Asp Val Lys Ser Ala Asn Ile
        435   440   445

Leu Ile Asp Lys Asn Leu Arg Gly Lys Val Ala Asp Phe Gly Leu Thr
    450   455   460

Lys Leu Ile Glu Val Gly Asn Ser Thr Leu Gln Thr Arg Leu Val Gly
465   470   475   480

Thr Phe Gly Tyr Met Pro Pro Glu Tyr Ala Gln Tyr Gly Asp Ile Ser
            485   490   495

Pro Lys Ile Asp Val Tyr Ala Phe Gly Val Val Leu Phe Glu Leu Ile
        500   505   510

Ser Ala Lys Asn Ala Val Leu Lys Thr Gly Glu Leu Val Ala Glu Ser
        515   520   525

Lys Gly Leu Val Ala Leu Phe Glu Glu Ala Leu Asn Lys Ser Asp Pro
    530   535   540

Cys Asp Ala Leu Arg Lys Leu Val Asp Pro Arg Leu Gly Glu Asn Tyr
545   550   555   560

Pro Ile Asp Ser Val Leu Lys Ile Ala Gln Leu Gly Arg Ala Cys Thr
            565   570   575

Arg Asp Asn Pro Leu Leu Arg Pro Ser Met Arg Ser Leu Val Val Ala
            580   585   590

Leu Met Thr Leu Ser Ser Leu Thr Glu Asp Cys Asp Asp Glu Ser Ser
        595   600   605

Tyr Glu Ser Gln Thr Leu Ile Asn Leu Leu Ser Val Arg
    610   615   620

<210>   25
<211>   623
<212>   PRT
<213>   Lotus japonicus Gifu

<400> 25

Met Lys Leu Lys Thr Gly Leu Leu Leu Phe Phe Ile Leu Leu Leu Gly
1   5   10   15

His Val Cys Phe His Val Glu Ser Asn Cys Leu Lys Gly Cys Asp Leu
            20   25   30

Ala Leu Ala Ser Tyr Tyr Ile Leu Pro Gly Val Phe Ile Leu Gln Asn
        35   40   45

Ile Thr Thr Phe Met Gln Ser Glu Ile Val Ser Ser Asn Asp Ala Ile
    50   55   60

Thr Ser Tyr Asn Lys Asp Lys Ile Leu Asn Asp Ile Asn Ile Gln Ser
65   70   75   80

Phe Gln Arg Leu Asn Ile Pro Phe Pro Cys Asp Cys Ile Gly Gly Glu
            85   90   95

Phe Leu Gly His Val Phe Glu Tyr Ser Ala Ser Lys Gly Asp Thr Tyr
            100   105   110

Glu Thr Ile Ala Asn Leu Tyr Tyr Ala Asn Leu Thr Thr Val Asp Leu
        115   120   125

Leu Lys Arg Phe Asn Ser Tyr Asp Pro Lys Asn Ile Pro Val Asn Ala
    130   135   140

Lys Val Asn Val Thr Val Asn Cys Ser Cys Gly Asn Ser Gln Val Ser
145   150   155   160

Lys Asp Tyr Gly Leu Phe Ile Thr Tyr Pro Ile Arg Pro Gly Asp Thr
            165   170   175

Leu Gln Asp Ile Ala Asn Gln Ser Ser Leu Asp Ala Gly Leu Ile Gln
            180   185   190

Ser Phe Asn Pro Ser Val Asn Phe Ser Lys Asp Ser Gly Ile Ala Phe
        195   200   205

Ile Pro Gly Arg Tyr Lys Asn Gly Val Tyr Val Pro Leu Tyr His Arg
    210   215   220

Thr Ala Gly Leu Ala Ser Gly Ala Ala Val Gly Ile Ser Ile Ala Gly
225   230   235   240

33

Thr Phe Val Leu Leu Leu Leu Ala Phe Cys Met Tyr Val Arg Tyr Gln
            245   250   255

Lys Lys Glu Glu Glu Lys Ala Lys Leu Pro Thr Asp Ile Ser Met Ala
            260   265   270

Leu Ser Thr Gln Asp Ala Gly Asn Ser Ser Ser Ala Glu Tyr Glu Thr
            275   280   285

Ser Gly Ser Ser Gly Pro Gly Thr Ala Ser Ala Thr Gly Leu Thr Ser
    290   295 ·   300

Ile Met Val Ala Lys Ser Met Glu Phe Ser Tyr Gln Glu Leu Ala Lys
305   310   315   320

Ala Thr Asn Asn Phe Ser Leu Asp Asn Lys Ile Gly Gln Gly Gly Phe
                325   330   335

Gly Ala Val Tyr Tyr Ala Glu Leu Arg Gly Lys Lys Thr Ala Ile Lys
                340   345   350

Lys Met Asp Val Gln Ala Ser Thr Glu Phe Leu Cys Glu Leu Lys Val
            355   360   365

Leu Thr His Val His His Leu Asn Leu Val Arg Leu Ile Gly Tyr Cys
    370   375   380

Val Glu Gly Ser Leu Phe Leu Val Tyr Glu His Ile Asp Asn Gly Asn
385   390   395   400

Leu Gly Gln Tyr Leu His Gly Ser Gly Lys Glu Pro Leu Pro Trp Ser
                405   410   415

Ser Arg Val Gln Ile Ala Leu Asp Ala Ala Arg Gly Leu Glu Tyr Ile
            420   425   430

His Glu His Thr Val Pro Val Tyr Ile His Arg Asp Val Lys Ser Ala
            435   440   445

Asn Ile Leu Ile Asp Lys Asn Leu Arg Gly Lys Val Ala Asp Phe Gly
    450   455   460

Leu Thr Lys Leu Ile Glu Val Gly Asn Ser Thr Leu Gln Thr Arg Leu
465   470   475   480

34

Val Gly Thr Phe Gly Tyr Met Pro Pro Glu Tyr Ala Gln Tyr Gly Asp
            485   490   495

Ile Ser Pro Lys Ile Asp Val Tyr Ala Phe Gly Val Val Leu Phe Glu
            500   505   510

Leu Ile Ser Ala Lys Asn Ala Val Leu Lys Thr Gly Glu Leu Val Ala
            515   520   525

Glu Ser Lys Gly Leu Val Ala Leu Phe Glu Glu Ala Leu Asn Lys Ser
    530   535   540

Asp Pro Cys Asp Ala Leu Arg Lys Leu Val Asp Pro Arg Leu Gly Glu
545   550   555   560

Asn Tyr Pro Ile Asp Ser Val Leu Lys Ile Ala Gln Leu Gly Arg Ala
            565   570   575

Cys Thr Arg Asp Asn Pro Leu Leu Arg Pro Ser Met Arg Ser Leu Val
            580   585   590

Val Ala Leu Met Thr Leu Ser Ser Leu Thr Glu Asp Cys Asp Asp Glu
            595   600   605

Ser Ser Tyr Glu Ser Gln Thr Leu Ile Asn Leu Leu Ser Val Arg
    610   615   620

<210>   26
<211>   19
<212>   DNA
<213>   Lotus japonicus

<400>   26
aatgctcttg atcaggctg   19

<210>   27
<211>   20
<212>   DNA
<213>   Lotus japonicus

<400>   27
aggagcccaa gtgagtgcta   20

<210>   28
<211>   20
<212>   DNA
<213>   Lotus japonicus

<400> 28
caggaaaaac caccacctgt   20

<210> 29
<211> 21
<212> DNA
<213> Lotus japonicus

<400> 29
atggaggcga atacactggt g   21

<210> 30
<211> 1853
<212> DNA
<213> Lotus filicaulis

<400> 30
ttttctcttt ccctgttaac tatcatttgt tcccaacttc acaaacatgg ctgtcttctt   60

tcttacctct ggctctctga gtctttttct tgcactcacg ttgcttttca ctaacatcgc   120

cgctcgatca gaacagatca gcggcccaga cttttcatgc cctgttgact cacctccttc   180

ttgtgaaaca tatgtgacat acacagctca gtctccaaat cttctgagcc tgacaaacat   240

atctgatata tttgatatca gtcctttgtc cattgcaaga gccagtaaca tagatgcagg   300

gaaggacaag ctggttccag gccaagtctt actggtacct gtaacttgcg gttgcgccgg   360

aaaccactct tctgccaata cctcctacca aatccagaaa ggtgatagct acgactttgt   420

tgcaaccact ttatatgaga accttacaaa ttggaatata gtacaagctt caaacccagg   480

ggtaaatcca tatttgttgc cagagcgcgt caaagtcgta ttccctttat tctgcaggtg   540

cccttcaaag aaccagttga acaaagggat tcagtatctg attacttatg tgtggaagcc   600

caatgacaat gtttcccttg tgagtgccaa gtttggtgca tccccagcgg acatattgac   660

tgaaaaccgc tacggtcaag acttcactgc tgcaaccaac cttccaattt tgatcccagt   720

gacacagttg ccaaagctta ctcaaccttc ttcaaatgga aggaaaagca gcattcatct   780

tctggttata cttggtatta ccctgggatg cacgttgcta actgcagttt taaccgggac   840

cctcgtatat gtatactgcc gcagaaagaa ggctctgaat aggactgctt catcagctga   900

gactgctgat aaactacttt ctggagtttc aggctatgta agcaagccaa acgtgtatga   960

aatcgacgag ataatggaag ctacgaagga tttcagcgat gagtgcaagg ttggggaatc   1020

agtgtacaag gccaacatag aaggtcgggt tgtagcggta agaaaatca aggaaggtgg   1080

tgccaatgag gaactgaaaa ttctgcagaa ggtaaatcat ggaaatctgg tgaaactaat   1140

gggtgtctcc tcaggctatg atggaaactg tttcttggtt tatgaatatg ctgaaaatgg   1200

36

gtctcttgct gagtggctgt tctccaagtc ttcaggaacc ccaaactccc ttacatggtc   1260

tcaaaggata agcatagcag tggatgttgc tgtgggtctg caatacatgc atgaacatac   1320

ctatccaaga ataatacaca gggacatcac aacaagtaat atccttctcg actcgacctt   1380

caaggccaag atagcaaatt tcgccatggc cagaacttcg accaacccca tgatgccaaa   1440

aatcgatgtc ttcgctttcg gggtgcttct gatagagttg ctcaccggaa ggaaagccat   1500

gacaaccaag gagaacggcg aggtggttat gctgtggaag gatatgtggg agatctttga   1560

catagaagag aatagagagg agaggatcag aaaatggatg gatcctaatt tagagagctt   1620

ttatcatata gataatgctc tcagcttggc atccttagca gtgaattgca cagctgataa   1680

gtctttgtct cgaccctcca tggctgaaat tgttcttagc ctctcctttc tcactcaaca   1740

atcatctaac cccacattag agagatcctt gacttcttct gggttagatg tagaagatga   1800

tgctcatatt gtcacttcca ttacagcacg ttaagcaagg gaaggtaatt cag   1853

<210> 31
<211> 595
<212> PRT
<213> Lotus filicaulis

<400> 31

Met Ala Val Phe Phe Leu Thr Ser Gly Ser Leu Ser Leu Phe Leu Ala
1   5   10   15

Leu Thr Leu Leu Phe Thr Asn Ile Ala Ala Arg Ser Glu Gln Ile Ser
        20   25   30

Gly Pro Asp Phe Ser Cys Pro Val Asp Ser Pro Pro Ser Cys Glu Thr
        35   40   45

Tyr Val Thr Tyr Thr Ala Gln Ser Pro Asn Leu Leu Ser Leu Thr Asn
    50   55   60

Ile Ser Asp Ile Phe Asp Ile Ser Pro Leu Ser Ile Ala Arg Ala Ser
65   70   75   80

Asn Ile Asp Ala Gly Lys Asp Lys Leu Val Pro Gly Gln Val Leu Leu
            85   90   95

Val Pro Val Thr Cys Gly Cys Ala Gly Asn His Ser Ser Ala Asn Thr
            100   105   110

Ser Tyr Gln Ile Gln Lys Gly Asp Ser Tyr Asp Phe Val Ala Thr Thr
        115   120   125

37

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Leu Tyr Glu Asn Leu Thr Asn Trp Asn Ile Val Gln Ala Ser Asn Pro
    130                 135                 140

Gly Val Asn Pro Tyr Leu Leu Pro Glu Arg Val Lys Val Val Phe Pro
145                 150                 155                 160

Leu Phe Cys Arg Cys Pro Ser Lys Asn Gln Leu Asn Lys Gly Ile Gln
                165                 170                 175

Tyr Leu Ile Thr Tyr Val Trp Lys Pro Asn Asp Asn Val Ser Leu Val
            180                 185                 190

Ser Ala Lys Phe Gly Ala Ser Pro Ala Asp Ile Leu Thr Glu Asn Arg
        195                 200                 205

Tyr Gly Gln Asp Phe Thr Ala Ala Thr Asn Leu Pro Ile Leu Ile Pro
    210                 215                 220

Val Thr Gln Leu Pro Lys Leu Thr Gln Pro Ser Ser Asn Gly Arg Lys
225                 230                 235                 240

Ser Ser Ile His Leu Leu Val Ile Leu Gly Ile Thr Leu Gly Cys Thr
            245                 250                 255

Leu Leu Thr Ala Val Leu Thr Gly Thr Leu Val Tyr Val Tyr Cys Arg
            260                 265                 270

Arg Lys Lys Ala Leu Asn Arg Thr Ala Ser Ser Ala Glu Thr Ala Asp
        275                 280                 285

Lys Leu Leu Ser Gly Val Ser Gly Tyr Val Ser Lys Pro Asn Val Tyr
    290                 295                 300

Glu Ile Asp Glu Ile Met Glu Ala Thr Lys Asp Phe Ser Asp Glu Cys
305                 310                 315                 320

Lys Val Gly Glu Ser Val Tyr Lys Ala Asn Ile Glu Gly Arg Val Val
                325                 330                 335

Ala Val Lys Lys Ile Lys Glu Gly Gly Ala Asn Glu Glu Leu Lys Ile
        340                 345                 350

Leu Gln Lys Val Asn His Gly Asn Leu Val Lys Leu Met Gly Val Ser
        355                 360                 365
                            38
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Ser Gly Tyr Asp Gly Asn Cys Phe Leu Val Tyr Glu Tyr Ala Glu Asn
    370             375             380

Gly Ser Leu Ala Glu Trp Leu Phe Ser Lys Ser Ser Gly Thr Pro Asn
385             390             395             400

Ser Leu Thr Trp Ser Gln Arg Ile Ser Ile Ala Val Asp Val Ala Val
            405             410             415

Gly Leu Gln Tyr Met His Glu His Thr Tyr Pro Arg Ile Ile His Arg
            420             425             430

Asp Ile Thr Thr Ser Asn Ile Leu Leu Asp Ser Thr Phe Lys Ala Lys
        435             440             445

Ile Ala Asn Phe Ala Met Ala Arg Thr Ser Thr Asn Pro Met Met Pro
    450             455             460

Lys Ile Asp Val Phe Ala Phe Gly Val Leu Leu Ile Glu Leu Leu Thr
465             470             475             480

Gly Arg Lys Ala Met Thr Thr Lys Glu Asn Gly Glu Val Val Met Leu
            485             490             495

Trp Lys Asp Met Trp Glu Ile Phe Asp Ile Glu Glu Asn Arg Glu Glu
            500             505             510

Arg Ile Arg Lys Trp Met Asp Pro Asn Leu Glu Ser Phe Tyr His Ile
            515             520             525

Asp Asn Ala Leu Ser Leu Ala Ser Leu Ala Val Asn Cys Thr Ala Asp
        530             535             540

Lys Ser Leu Ser Arg Pro Ser Met Ala Glu Ile Val Leu Ser Leu Ser
545             550             555             560

Phe Leu Thr Gln Gln Ser Ser Asn Pro Thr Leu Glu Arg Ser Leu Thr
            565             570             575

Ser Ser Gly Leu Asp Val Glu Asp Asp Ala His Ile Val Thr Ser Ile
            580             585             590

Thr Ala Arg
        595
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<210>  32
<211>  595
<212>  PRT
<213>  Medicago truncatula


<220>
<221>  PEPTIDE
<222>  (1)..(595)


<400>  32

Met Ser Ala Phe Phe Leu Pro Ser Ser Ser His Ala Leu Phe Leu Val
1               5                   10                  15


Leu Met Leu Phe Phe Leu Thr Asn Ile Ser Ala Gln Pro Leu Tyr Ile
            20                  25                  30


Ser Glu Thr Asn Phe Thr Cys Pro Val Asp Ser Pro Pro Ser Cys Glu
        35                  40                  45


Thr Tyr Val Ala Tyr Arg Ala Gln Ser Pro Asn Phe Leu Ser Leu Ser
    50                  55                  60


Asn Ile Ser Asp Ile Phe Asn Leu Ser Pro Leu Arg Ile Ala Lys Ala
65                  70                  75                  80


Ser Asn Ile Glu Ala Glu Asp Lys Lys Leu Ile Pro Asp Gln Leu Leu
            85                  90                  95


Leu Val Pro Val Thr Cys Gly Cys Thr Lys Asn His Ser Phe Ala Asn
            100                 105                 110


Ile Thr Tyr Ser Ile Lys Gln Gly Asp Asn Phe Phe Ile Leu Ser Ile
        115                 120                 125


Thr Ser Tyr Gln Asn Leu Thr Asn Tyr Leu Glu Phe Lys Asn Phe Asn
    130                 135                 140


Pro Asn Leu Ser Pro Thr Leu Leu Pro Leu Asp Thr Lys Val Ser Val
145                 150                 155                 160


Pro Leu Phe Cys Lys Cys Pro Ser Lys Asn Gln Leu Asn Lys Gly Ile
            165                 170                 175


Lys Tyr Leu Ile Thr Tyr Val Trp Gln Asp Asn Asp Asn Val Thr Leu
            180                 185                 190
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40

```
Val Ser Ser Lys Phe Gly Ala Ser Gln Val Glu Met Leu Ala Glu Asn
        195                 200                 205

Asn His Asn Phe Thr Ala Ser Thr Asn Arg Ser Val Leu Ile Pro Val
    210                 215                 220

Thr Ser Leu Pro Lys Leu Asp Gln Pro Ser Ser Asn Gly Arg Lys Ser
225                 230                 235                 240

Ser Ser Gln Asn Leu Ala Leu Ile Ile Gly Ile Ser Leu Gly Ser Ala
            245                 250                 255

Phe Phe Ile Leu Val Leu Thr Leu Ser Leu Val Tyr Val Tyr Cys Leu
            260                 265                 270

Lys Met Lys Arg Leu Asn Arg Ser Thr Ser Ser Ser Glu Thr Ala Asp
        275                 280                 285

Lys Leu Leu Ser Gly Val Ser Gly Tyr Val Ser Lys Pro Thr Met Tyr
    290                 295                 300

Glu Ile Asp Ala Ile Met Glu Gly Thr Thr Asn Leu Ser Asp Asn Cys
305                 310                 315                 320

Lys Ile Gly Glu Ser Val Tyr Lys Ala Asn Ile Asp Gly Arg Val Leu
            325                 330                 335

Ala Val Lys Lys Ile Lys Lys Asp Ala Ser Glu Glu Leu Lys Ile Leu
        340                 345                 350

Gln Lys Val Asn His Gly Asn Leu Val Lys Leu Met Gly Val Ser Ser
        355                 360                 365

Asp Asn Asp Gly Asn Cys Phe Leu Val Tyr Glu Tyr Ala Glu Asn Gly
    370                 375                 380

Ser Leu Glu Glu Trp Leu Phe Ser Glu Ser Ser Lys Thr Ser Asn Ser
385                 390                 395                 400

Val Val Ser Leu Thr Trp Ser Gln Arg Ile Thr Ile Ala Met Asp Val
            405                 410                 415

Ala Ile Gly Leu Gln Tyr Met His Glu His Thr Tyr Pro Arg Ile Ile
        420                 425                 430
                          41
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```
His Arg Asp Ile Thr Thr Ser Asn Ile Leu Leu Gly Ser Asn Phe Lys
        435             440             445

Ala Lys Ile Ala Asn Phe Gly Met Ala Arg Thr Ser Thr Asn Ser Met
        450             455             460

Met Pro Lys Ile Asp Val Phe Ala Phe Gly Val Val Leu Ile Glu Leu
465             470             475             480

Leu Thr Gly Lys Lys Ala Met Thr Thr Lys Glu Asn Gly Glu Val Val
            485             490             495

Ile Leu Trp Lys Asp Phe Trp Lys Ile Phe Asp Leu Glu Gly Asn Arg
        500             505             510

Glu Glu Arg Leu Arg Lys Trp Met Asp Pro Lys Leu Glu Ser Phe Tyr
        515             520             525

Pro Ile Asp Asn Ala Leu Ser Leu Ala Ser Leu Ala Val Asn Cys Thr
        530             535             540

Ala Asp Lys Ser Leu Ser Arg Pro Thr Ile Ala Glu Ile Val Leu Cys
545             550             555             560

Leu Ser Leu Leu Asn Gln Pro Ser Ser Glu Pro Met Leu Glu Arg Ser
            565             570             575

Leu Thr Ser Gly Leu Asp Ala Glu Ala Thr His Val Val Thr Ser Val
            580             585             590

Ile Ala Arg
        595


<210>  33
<211>  24
<212>  DNA
<213>  Phaseolus vulgaris


<220>
<221>  misc_feature
<222>  (1)..(24)
<223>  Primer to amplify fragment of NPR5

<400>  33
cattgcaara gccagtaaca taga                                           24
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<210> 34
<211> 30
<212> DNA
<213> Phaseolus vulgaris

<220>
<221> misc_feature
<222> (1)..(30)
<223> To amplify a fragment of NPR5

<400> 34
aacgwgcwry wayrgaagtm acaayatgag   30

<210> 35
<211> 35
<212> DNA
<213> Phaseolus vulgaris

<220>
<221> misc_feature
<222> (1)..(35)
<223> NPR5 5'RACE primer

<400> 35
cgactgggat atgtatgtca catatgtttc acatg   35

<210> 36
<211> 22
<212> DNA
<213> Phaseolus vulgaris

<220>
<221> misc_feature
<222> (1)..(22)
<223> NPR5 3' RACE primer

<400> 36
gatagaattg cttactggca gg   22

<210> 37
<211> 21
<212> DNA
<213> Phaseolus vulgaris

<220>
<221> misc_feature
<222> (1)..(21)

<400> 37
gacgtgtcca ctgtatccag g   21

<210> 38
<211> 24
<212> DNA
<213> Phaseolus vulgaris

<220>
<221> misc_feature
<222> (1)..(24)
<223> NPR5 gene PCR primer

<400> 38
gtttggacat gcaataaaca actc   24

<210> 39
<211> 2164
<212> DNA
<213> Phaseolus vulgaris

<220>
<221> 5'UTR
<222> (1)..(172)

<220>
<221> CDS
<222> (173)..(1963)

<220>
<221> 3'UTR
<222> (1964)..(2164)

<400> 39
ggattcggaa agccaaaagg aaatttagtt aaagctaatg acacaaacag gaccatattt   60

ttatattaag ccaaaagata tttttattga caaagaacta catatcaaca acgacgattg   120

ccagtgatag tagactgcct cataactttc atttgttcac aacttcacat ca atg gct   178
                                                            Met Ala
                                                             1

gtc ttc ttt gtt tct ctt act ctt ggt gct cag att ctt tat gtg gta   226
Val Phe Phe Val Ser Leu Thr Leu Gly Ala Gln Ile Leu Tyr Val Val
         5   10   15

ctc atg ttt ttc act tgt att gaa gct caa tca caa cag acc aat gga   274
Leu Met Phe Phe Thr Cys Ile Glu Ala Gln Ser Gln Gln Thr Asn Gly
     20   25   30

aca aac ttt tca tgc cct tcc aat tca cct cct tca tgt gaa aca tat   322
Thr Asn Phe Ser Cys Pro Ser Asn Ser Pro Pro Ser Cys Glu Thr Tyr
35   40   45   50

gtg aca tac ata tcc cag tcg cca aat ttt ttg agt ctg acc agc gta   370
Val Thr Tyr Ile Ser Gln Ser Pro Asn Phe Leu Ser Leu Thr Ser Val
             55   60   65

tct aat ata ttt gac acg agt cct ttg tca att gcc aga gcc agc aac   418
Ser Asn Ile Phe Asp Thr Ser Pro Leu Ser Ile Ala Arg Ala Ser Asn

44

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tta cag cat gag gaa gac aag ttg att cca ggc caa gtc tta ctg ata      466
Leu Gln His Glu Glu Asp Lys Leu Ile Pro Gly Gln Val Leu Leu Ile
        85                  90                  95

cca gta acc tgt ggt tgc act gga aac cgc tct ttc gcc aac atc tcc      514
Pro Val Thr Cys Gly Cys Thr Gly Asn Arg Ser Phe Ala Asn Ile Ser
        100                 105                 110

tat gag atc aac caa ggt gat agc ttc tac ttt gtt gcg acc act tta      562
Tyr Glu Ile Asn Gln Gly Asp Ser Phe Tyr Phe Val Ala Thr Thr Leu
115                 120                 125                 130

tac cag aat ctc aca aat tgg cat gca gtg atg gat tta aac cca ggt      610
Tyr Gln Asn Leu Thr Asn Trp His Ala Val Met Asp Leu Asn Pro Gly
            135                 140                 145

cta agt caa ttt act ttg cca ata ggc atc caa gtt gta att cct tta      658
Leu Ser Gln Phe Thr Leu Pro Ile Gly Ile Gln Val Val Ile Pro Leu
            150                 155                 160

ttc tgc aag tgt cct tca aag aac cag ctg gat aga ggg ata aag tac      706
Phe Cys Lys Cys Pro Ser Lys Asn Gln Leu Asp Arg Gly Ile Lys Tyr
            165                 170                 175

ctg atc act cac gtc tgg cag ccc aat gac aat gtt tcc ttt gta agt      754
Leu Ile Thr His Val Trp Gln Pro Asn Asp Asn Val Ser Phe Val Ser
            180                 185                 190

aac aag tta ggt gca tca cca cag gac ata ttg agt gaa aac aac tat      802
Asn Lys Leu Gly Ala Ser Pro Gln Asp Ile Leu Ser Glu Asn Asn Tyr
195                 200                 205                 210

ggt caa aat ttc act gcc gca agc aac ctt cca gtt ttg atc cca gtt      850
Gly Gln Asn Phe Thr Ala Ala Ser Asn Leu Pro Val Leu Ile Pro Val
            215                 220                 225

aca ctc ttg cca gat ctt att caa tct cct tca gat gga aga aaa cac      898
Thr Leu Leu Pro Asp Leu Ile Gln Ser Pro Ser Asp Gly Arg Lys His
            230                 235                 240

aga att ggt ctt cca gtt ata att ggt atc agc ctg gga tgc aca cta      946
Arg Ile Gly Leu Pro Val Ile Ile Gly Ile Ser Leu Gly Cys Thr Leu
            245                 250                 255

ctg gtt gtg gtt tca gca ata tta ctg gtg tgt gta tgt tgt ctg aaa      994
Leu Val Val Val Ser Ala Ile Leu Leu Val Cys Val Cys Cys Leu Lys
            260                 265                 270

atg aag agt ttg aat agg agt gct tca tca gct gaa act gca gat aaa      1042
Met Lys Ser Leu Asn Arg Ser Ala Ser Ser Ala Glu Thr Ala Asp Lys
275                 280                 285                 290

cta ctt tct gga gtt tca ggc tat gta agt aag cct aca atg tat gaa      1090
Leu Leu Ser Gly Val Ser Gly Tyr Val Ser Lys Pro Thr Met Tyr Glu
            295                 300                 305

act ggt gca ata ttg gaa gct act atg aac ctc agt gag cag tgc aag      1138
Thr Gly Ala Ile Leu Glu Ala Thr Met Asn Leu Ser Glu Gln Cys Lys
```

45

att ggg gaa tca gtg tac aag gct aac ata gag ggt aag gtt tta gca   1186
Ile Gly Glu Ser Val Tyr Lys Ala Asn Ile Glu Gly Lys Val Leu Ala
        325   330   335

gta aaa aga ttc aag gaa gat gtc acg gag gag ctg aaa att ctg cag   1234
Val Lys Arg Phe Lys Glu Asp Val Thr Glu Glu Leu Lys Ile Leu Gln
        340   345   350

aag gtg aat cat gga aat ctg gtg aaa cta atg ggt gtc tca tca gat   1282
Lys Val Asn His Gly Asn Leu Val Lys Leu Met Gly Val Ser Ser Asp
355   360   365   370

aat gat gga aat tgt ttt gtg gtt tat gaa tat gct gaa aat ggg tct   1330
Asn Asp Gly Asn Cys Phe Val Val Tyr Glu Tyr Ala Glu Asn Gly Ser
                375   380   385

ctt gaa gag tgg ctt ttc gcc aag tct tgt tca gag aca tca aac tca   1378
Leu Glu Glu Trp Leu Phe Ala Lys Ser Cys Ser Glu Thr Ser Asn Ser
                390   395   400

agg acc tcc ctt aca tgg tgc cag agg ata agc ata gca gtg gat gtt   1426
Arg Thr Ser Leu Thr Trp Cys Gln Arg Ile Ser Ile Ala Val Asp Val
                405   410   415

tca atg ggt ctg cag tac atg cat gaa cat gct tat cca aga ata gtc   1474
Ser Met Gly Leu Gln Tyr Met His Glu His Ala Tyr Pro Arg Ile Val
                420   425   430

cac agg gac atc aca agc agt aat atc ctt ctt gac tcc aac ttt aag   1522
His Arg Asp Ile Thr Ser Ser Asn Ile Leu Leu Asp Ser Asn Phe Lys
435   440   445   450

gcc aag ata gca aat ttc tcc atg gcc aga act ttt acc aac ccc atg   1570
Ala Lys Ile Ala Asn Phe Ser Met Ala Arg Thr Phe Thr Asn Pro Met
                455   460   465

atg tca aaa ata gat gta ttt gct ttt ggg gtg gtt ctg ata gaa ttg   1618
Met Ser Lys Ile Asp Val Phe Ala Phe Gly Val Val Leu Ile Glu Leu
                470   475   480

ctt act ggc agg aaa gcc atg aca acc aaa gaa aat ggt gag gtg gtt   1666
Leu Thr Gly Arg Lys Ala Met Thr Thr Lys Glu Asn Gly Glu Val Val
                485   490   495

atg ctg tgg aag gac att tgg aag atc ttt gat caa gaa gag aat aga   1714
Met Leu Trp Lys Asp Ile Trp Lys Ile Phe Asp Gln Glu Glu Asn Arg
        500   505   510

gag gag agg ctc aga aaa tgg atg gat cct aag tta gat aat tat tat   1762
Glu Glu Arg Leu Arg Lys Trp Met Asp Pro Lys Leu Asp Asn Tyr Tyr
515   520   525   530

cct att gat tat gct ctc agc ttg gcc tcc ttg gca gtg aat tgc act   1810
Pro Ile Asp Tyr Ala Leu Ser Leu Ala Ser Leu Ala Val Asn Cys Thr
                535   540   545

gca gac aag tct ttg tcc aga cca acc ata gca gaa att gtc ctt agt   1858
Ala Asp Lys Ser Leu Ser Arg Pro Thr Ile Ala Glu Ile Val Leu Ser

```
ctc tcc ctt ctc act caa cca tct ccc gcg aca ctg gag aga tcc ttg    1906
Leu Ser Leu Leu Thr Gln Pro Ser Pro Ala Thr Leu Glu Arg Ser Leu
        565                 570                 575

act tct tct gga tta gat gta gaa gct act caa att gtc act tcc atc    1954
Thr Ser Ser Gly Leu Asp Val Glu Ala Thr Gln Ile Val Thr Ser Ile
        580                 585                 590

tca gct cgt tgattgagtg aagccaatct agtttctcac atccaagatg           2003
Ser Ala Arg
595

gtactttttt ttaaataatg attgcacctt agtcaataat gatgaacttg gtttatgggg  2063

agttttcaac atttagtgtt tccatccctg ttgttcttta tgtttgaggt agagttcgta  2123

aaacgaatag caattgcagt tctcctcaga ctaaatttgc t                     2164
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<210> 40
<211> 597
<212> PRT
<213> Phaseolus vulgaris

<400> 40

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Met Ala Val Phe Phe Val Ser Leu Thr Leu Gly Ala Gln Ile Leu Tyr
1               5                   10                  15


Val Val Leu Met Phe Phe Thr Cys Ile Glu Ala Gln Ser Gln Gln Thr
            20                  25                  30


Asn Gly Thr Asn Phe Ser Cys Pro Ser Asn Ser Pro Pro Ser Cys Glu
        35                  40                  45


Thr Tyr Val Thr Tyr Ile Ser Gln Ser Pro Asn Phe Leu Ser Leu Thr
    50                  55                  60


Ser Val Ser Asn Ile Phe Asp Thr Ser Pro Leu Ser Ile Ala Arg Ala
65                  70                  75                  80


Ser Asn Leu Gln His Glu Glu Asp Lys Leu Ile Pro Gly Gln Val Leu
            85                  90                  95


Leu Ile Pro Val Thr Cys Gly Cys Thr Gly Asn Arg Ser Phe Ala Asn
            100                 105                 110


Ile Ser Tyr Glu Ile Asn Gln Gly Asp Ser Phe Tyr Phe Val Ala Thr
            115                 120                 125
```

47

```
Thr Leu Tyr Gln Asn Leu Thr Asn Trp His Ala Val Met Asp Leu Asn
    130                 135             140

Pro Gly Leu Ser Gln Phe Thr Leu Pro Ile Gly Ile Gln Val Val Ile
145                 150                 155                 160

Pro Leu Phe Cys Lys Cys Pro Ser Lys Asn Gln Leu Asp Arg Gly Ile
                165                 170                 175

Lys Tyr Leu Ile Thr His Val Trp Gln Pro Asn Asp Asn Val Ser Phe
            180                 185                 190

Val Ser Asn Lys Leu Gly Ala Ser Pro Gln Asp Ile Leu Ser Glu Asn
        195                 200                 205

Asn Tyr Gly Gln Asn Phe Thr Ala Ala Ser Asn Leu Pro Val Leu Ile
    210                 215                 220

Pro Val Thr Leu Leu Pro Asp Leu Ile Gln Ser Pro Ser Asp Gly Arg
225                 230                 235                 240

Lys His Arg Ile Gly Leu Pro Val Ile Ile Gly Ile Ser Leu Gly Cys
            245                 250                 255

Thr Leu Leu Val Val Val Ser Ala Ile Leu Leu Val Cys Val Cys Cys
        260                 265                 270

Leu Lys Met Lys Ser Leu Asn Arg Ser Ala Ser Ser Ala Glu Thr Ala
        275                 280                 285

Asp Lys Leu Leu Ser Gly Val Ser Gly Tyr Val Ser Lys Pro Thr Met
    290                 295                 300

Tyr Glu Thr Gly Ala Ile Leu Glu Ala Thr Met Asn Leu Ser Glu Gln
305                 310                 315                 320

Cys Lys Ile Gly Glu Ser Val Tyr Lys Ala Asn Ile Glu Gly Lys Val
            325                 330                 335

Leu Ala Val Lys Arg Phe Lys Glu Asp Val Thr Glu Glu Leu Lys Ile
        340                 345                 350

Leu Gln Lys Val Asn His Gly Asn Leu Val Lys Leu Met Gly Val Ser
        355                 360                 365
```

Ser Asp Asn Asp Gly Asn Cys Phe Val Val Tyr Glu Tyr Ala Glu Asn
    370   375   380

Gly Ser Leu Glu Glu Trp Leu Phe Ala Lys Ser Cys Ser Glu Thr Ser
385   390   395   400

Asn Ser Arg Thr Ser Leu Thr Trp Cys Gln Arg Ile Ser Ile Ala Val
            405   410   415

Asp Val Ser Met Gly Leu Gln Tyr Met His Glu His Ala Tyr Pro Arg
            420   425   430

Ile Val His Arg Asp Ile Thr Ser Ser Asn Ile Leu Leu Asp Ser Asn
        435   440   445

Phe Lys Ala Lys Ile Ala Asn Phe Ser Met Ala Arg Thr Phe Thr Asn
    450   455   460

Pro Met Met Ser Lys Ile Asp Val Phe Ala Phe Gly Val Val Leu Ile
465   470   475   480

Glu Leu Leu Thr Gly Arg Lys Ala Met Thr Thr Lys Glu Asn Gly Glu
            485   490   495

Val Val Met Leu Trp Lys Asp Ile Trp Lys Ile Phe Asp Gln Glu Glu
        500   505   510

Asn Arg Glu Glu Arg Leu Arg Lys Trp Met Asp Pro Lys Leu Asp Asn
        515   520   525

Tyr Tyr Pro Ile Asp Tyr Ala Leu Ser Leu Ala Ser Leu Ala Val Asn
    530   535   540

Cys Thr Ala Asp Lys Ser Leu Ser Arg Pro Thr Ile Ala Glu Ile Val
545   550   555   560

Leu Ser Leu Ser Leu Leu Thr Gln Pro Ser Pro Ala Thr Leu Glu Arg
            565   570   575

Ser Leu Thr Ser Ser Gly Leu Asp Val Glu Ala Thr Gln Ile Val Thr
            580   585   590

Ser Ile Ser Ala Arg
        595

```
<210>  41
<211>  24
<212>  DNA
<213>  Glycine max


<220>
<221>  misc_feature
<222>  (1)..(24)
<223>  Primer to amplify NPR5 gene fragment

<400>  41
cattgcaara gccagtaaca taga                                        24


<210>  42
<211>  30
<212>  DNA
<213>  Glycine max


<220>
<221>  misc_feature
<222>  (1)..(30)
<223>  Primer to amplify NPR5 gene fragment

<400>  42
aacgwgcwry wayrgaagtm acaayatgag                                  30


<210>  43
<211>  31
<212>  DNA
<213>  Glycine max


<220>
<221>  misc_feature
<222>  (1)..(31)
<223>  NPR5 5'RACE primer

<400>  43
ccatcactgc acgccaattc gtgagattct c                                31


<210>  44
<211>  19
<212>  DNA
<213>  Glycine max


<220>
<221>  misc_feature
<222>  (1)..(19)
<223>  NPR5 3'RACE primer

<400>  44
gatgtctttg catttgggg                                              19
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<210> 45
<211> 26
<212> DNA
<213> Glycine max

<220>
<221> misc_feature
<222> (1)..(26)
<223> NPR5 gene PCR primers

<400> 45
ctaatacgac ataccaacaa ctgcag   26

<210> 46
<211> 24
<212> DNA
<213> Glycine max

<220>
<221> misc_feature
<222> (1)..(24)
<223> NPR5 gene PCR primer

<400> 46
ctcgcttgaa tttgtttgta catg   24

<210> 47
<211> 2130
<212> DNA
<213> Glycine max

<220>
<221> 5'UTR
<222> (1)..(68)

<220>
<221> CDS
<222> (69)..(1862)'

<220>
<221> 3'UTR
<222> (1863)..(2130)

<400> 47
ttgcctgtga taatagactc tccttattct ttccctcgtt acttacattt gttcacaact   60

aaacagca atg gct gtc ttc ttt ccc ttt ctt cct ctc cac tct cag att   110
          Met Ala Val Phe Phe Pro Phe Leu Pro Leu His Ser Gln Ile
            1   5   10

ctt tgt ctt gtg atc atg ttg ttt tcc act aat att gta gct caa tca   158
Leu Cys Leu Val Ile Met Leu Phe Ser Thr Asn Ile Val Ala Gln Ser
15   20   25   30

caa cag gac aat aga aca aac ttt tca tgc cct tct gat tca ccg cct   206

51

```
Gln Gln Asp Asn Arg Thr Asn Phe Ser Cys Pro Ser Asp Ser Pro Pro
                35                  40                  45

tca tgt gaa acc tat gta aca tac att gct cag tct cca aat ttt ttg      254
Ser Cys Glu Thr Tyr Val Thr Tyr Ile Ala Gln Ser Pro Asn Phe Leu
                50                  55                  60

agt cta acc aac ata tcc aat ata ttt gac aca agc cct tta tcc att      302
Ser Leu Thr Asn Ile Ser Asn Ile Phe Asp Thr Ser Pro Leu Ser Ile
                65                  70                  75

gca aga gcc agt aac tta gag cct atg gat gac aag cta gtc aaa gac      350
Ala Arg Ala Ser Asn Leu Glu Pro Met Asp Asp Lys Leu Val Lys Asp
        80                  85                  90

caa gtc tta ctc gta cca gta acc tgt ggt tgc act gga aac cgc tct      398
Gln Val Leu Leu Val Pro Val Thr Cys Gly Cys Thr Gly Asn Arg Ser
95                  100                 105                 110

ttt gcc aat atc tcc tat gag atc aac caa ggt gat agc ttc tac ttt      446
Phe Ala Asn Ile Ser Tyr Glu Ile Asn Gln Gly Asp Ser Phe Tyr Phe
                115                 120                 125

gtt gca acc act tca tac gag aat ctc acg aat tgg cgt gca gtg atg      494
Val Ala Thr Thr Ser Tyr Glu Asn Leu Thr Asn Trp Arg Ala Val Met
                130                 135                 140

gat tta aac ccc gtt cta agt cca aat aag ttg cca ata gga atc caa      542
Asp Leu Asn Pro Val Leu Ser Pro Asn Lys Leu Pro Ile Gly Ile Gln
                145                 150                 155

gta gta ttt cct tta ttc tgc aag tgc cct tca aag aac cag ttg gac      590
Val Val Phe Pro Leu Phe Cys Lys Cys Pro Ser Lys Asn Gln Leu Asp
        160                 165                 170

aaa gag ata aag tac ctg att aca tac gtg tgg aag ccc ggt gac aat      638
Lys Glu Ile Lys Tyr Leu Ile Thr Tyr Val Trp Lys Pro Gly Asp Asn
175                 180                 185                 190

gtt tcc ctt gta agt gac aag ttt ggt gca tca cca gag gac ata atg      686
Val Ser Leu Val Ser Asp Lys Phe Gly Ala Ser Pro Glu Asp Ile Met
                195                 200                 205

agt gaa aac aac tat ggt cag aac ttt act gct gca aac aac ctt cca      734
Ser Glu Asn Asn Tyr Gly Gln Asn Phe Thr Ala Ala Asn Asn Leu Pro
                210                 215                 220

gtt ctg atc cca gtg aca cgc ttg cca gtt ctt gct cga tct cct tcg      782
Val Leu Ile Pro Val Thr Arg Leu Pro Val Leu Ala Arg Ser Pro Ser
                225                 230                 235

gac gga aga aaa ggc gga att cgt ctt ccg gtt ata att ggt att agc      830
Asp Gly Arg Lys Gly Gly Ile Arg Leu Pro Val Ile Ile Gly Ile Ser
        240                 245                 250

ttg gga tgc acg cta ctg gtt ctg gtt tta gca gtg tta ctg gtg tat      878
Leu Gly Cys Thr Leu Leu Val Leu Val Leu Ala Val Leu Leu Val Tyr
255                 260                 265                 270

gta tat tgt ctg aaa atg aag act ttg aat agg agt gct tca tcg gct      926
```

52

```
Val Tyr Cys Leu Lys Met Lys Thr Leu Asn Arg Ser Ala Ser Ser Ala
                275                 280                 285

gaa act gca gat aaa cta ctt tct gga gtt tca ggc tat gta agt aag        974
Glu Thr Ala Asp Lys Leu Leu Ser Gly Val Ser Gly Tyr Val Ser Lys
                290                 295                 300

cct acc atg tat gaa act gat gcg atc atg gaa gct aca atg aac ctc       1022
Pro Thr Met Tyr Glu Thr Asp Ala Ile Met Glu Ala Thr Met Asn Leu
                305                 310                 315

agt gag cag tgc aag att ggg gaa tca gtg tac aag gca aac ata gag       1070
Ser Glu Gln Cys Lys Ile Gly Glu Ser Val Tyr Lys Ala Asn Ile Glu
                320                 325                 330

ggt aag gtt ttg gca gta aaa aga ttc aag gaa gat gtc acg gaa gag       1118
Gly Lys Val Leu Ala Val Lys Arg Phe Lys Glu Asp Val Thr Glu Glu
335                 340                 345                 350

ctg aaa att ctg cag aag gtg aat cat ggg aat ctg gtg aaa cta atg       1166
Leu Lys Ile Leu Gln Lys Val Asn His Gly Asn Leu Val Lys Leu Met
                355                 360                 365

ggt gtc tca tca gac aat gat gga aac tgt ttt gtg gtt tat gaa tac       1214
Gly Val Ser Ser Asp Asn Asp Gly Asn Cys Phe Val Val Tyr Glu Tyr
                370                 375                 380

gct gaa aat ggg tct ctt gat gag tgg cta ttc tcc aag tct tgt tca       1262
Ala Glu Asn Gly Ser Leu Asp Glu Trp Leu Phe Ser Lys Ser Cys Ser
                385                 390                 395

gac aca tca aac tca agg gca tcc ctt aca tgg tgt cag agg ata agc       1310
Asp Thr Ser Asn Ser Arg Ala Ser Leu Thr Trp Cys Gln Arg Ile Ser
                400                 405                 410

atg gca gtg gat gtt gcg atg ggt ttg cag tac atg cat gaa cat gct       1358
Met Ala Val Asp Val Ala Met Gly Leu Gln Tyr Met His Glu His Ala
415                 420                 425                 430

tat cca aga ata gtc cac agg gac atc aca agc agt aat atc ctt ctt       1406
Tyr Pro Arg Ile Val His Arg Asp Ile Thr Ser Ser Asn Ile Leu Leu
                435                 440                 445

gac tcg aac ttt aag gcc aag ata gca aat ttc tcc atg gcc aga act       1454
Asp Ser Asn Phe Lys Ala Lys Ile Ala Asn Phe Ser Met Ala Arg Thr
                450                 455                 460

ttt acc aac ccc atg atg cca aag ata gat gtc ttt gca ttt ggg gtg       1502
Phe Thr Asn Pro Met Met Pro Lys Ile Asp Val Phe Ala Phe Gly Val
                465                 470                 475

gtt ctg att gag ttg ctt acc gga agg aaa gcc atg aca acc aag gaa       1550
Val Leu Ile Glu Leu Leu Thr Gly Arg Lys Ala Met Thr Thr Lys Glu
                480                 485                 490

aat ggt gag gtg gtc atg ctg tgg aag gac att tgg aag atc ttt gat       1598
Asn Gly Glu Val Val Met Leu Trp Lys Asp Ile Trp Lys Ile Phe Asp
495                 500                 505                 510

caa gaa gag aat aga gag gag agg ctc aaa aaa tgg atg gat cct aag       1646
```

53

```
Gln Glu Glu Asn Arg Glu Glu Arg Leu Lys Lys Trp Met Asp Pro Lys
                515             520             525

tta gag agt tat tat cct ata gat tac gct ctc agc ttg gcc tcc ttg    1694
Leu Glu Ser Tyr Tyr Pro Ile Asp Tyr Ala Leu Ser Leu Ala Ser Leu
            530             535             540

gcg gtg aat tgt act gca gat aag tct ttg tcc aga cca acc att gca    1742
Ala Val Asn Cys Thr Ala Asp Lys Ser Leu Ser Arg Pro Thr Ile Ala
            545             550             555

gaa att gtc ctt agc ctc tcc ctt ctc act caa cca tct ccc gca aca    1790
Glu Ile Val Leu Ser Leu Ser Leu Leu Thr Gln Pro Ser Pro Ala Thr
        560             565             570

ttg gag aga tcc ttg act tct tct gga ttg gat gta gaa gct act caa    1838
Leu Glu Arg Ser Leu Thr Ser Ser Gly Leu Asp Val Glu Ala Thr Gln
575             580             585             590

att gtc act tcc ata gca gct cgt tgattgagtg aaggaaattt agtttctcaa    1892
Ile Val Thr Ser Ile Ala Ala Arg
                595

atccatgatg gtattttgtt tacatgatga ttattacatc tttagtcatt aatggttggc    1952

ttggtttggg ggagtgtgtt caaaatttcg ttttttttcca tccctgttat ttttttttaag    2012

tttggggtag agtcagcaaa aatggaagtt gcaattgacc tcagactaaa cttgcttatt    2072

tccctgtatc ttttttgtgt gataattgaa actgaattat atgatggatt atctgtta    2130


<210>  48
<211>  598
<212>  PRT
<213>  Glycine max

<400>  48

Met Ala Val Phe Phe Pro Phe Leu Pro Leu His Ser Gln Ile Leu Cys
1               5               10              15


Leu Val Ile Met Leu Phe Ser Thr Asn Ile Val Ala Gln Ser Gln Gln
            20              25              30


Asp Asn Arg Thr Asn Phe Ser Cys Pro Ser Asp Ser Pro Pro Ser Cys
            35              40              45


Glu Thr Tyr Val Thr Tyr Ile Ala Gln Ser Pro Asn Phe Leu Ser Leu
            50              55              60


Thr Asn Ile Ser Asn Ile Phe Asp Thr Ser Pro Leu Ser Ile Ala Arg
65              70              75              80


Ala Ser Asn Leu Glu Pro Met Asp Asp Lys Leu Val Lys Asp Gln Val
```

54

Leu Leu Val Pro Val Thr Cys Gly Cys Thr Gly Asn Arg Ser Phe Ala
            100   105   110

Asn Ile Ser Tyr Glu Ile Asn Gln Gly Asp Ser Phe Tyr Phe Val Ala
            115   120   125

Thr Thr Ser Tyr Glu Asn Leu Thr Asn Trp Arg Ala Val Met Asp Leu
    130   135   140

Asn Pro Val Leu Ser Pro Asn Lys Leu Pro Ile Gly Ile Gln Val Val
145   150   155   160

Phe Pro Leu Phe Cys Lys Cys Pro Ser Lys Asn Gln Leu Asp Lys Glu
            165   170   175

Ile Lys Tyr Leu Ile Thr Tyr Val Trp Lys Pro Gly Asp Asn Val Ser
            180   185   190

Leu Val Ser Asp Lys Phe Gly Ala Ser Pro Glu Asp Ile Met Ser Glu
            195   200   205

Asn Asn Tyr Gly Gln Asn Phe Thr Ala Ala Asn Asn Leu Pro Val Leu
    210   215   220

Ile Pro Val Thr Arg Leu Pro Val Leu Ala Arg Ser Pro Ser Asp Gly
225   230   235   240

Arg Lys Gly Gly Ile Arg Leu Pro Val Ile Ile Gly Ile Ser Leu Gly
                245   250   255

Cys Thr Leu Leu Val Leu Val Leu Ala Val Leu Leu Val Tyr Val Tyr
            260   265   270

Cys Leu Lys Met Lys Thr Leu Asn Arg Ser Ala Ser Ser Ala Glu Thr
            275   280   285

Ala Asp Lys Leu Leu Ser Gly Val Ser Gly Tyr Val Ser Lys Pro Thr
            290   295   300

Met Tyr Glu Thr Asp Ala Ile Met Glu Ala Thr Met Asn Leu Ser Glu
305   310   315   320

Gln Cys Lys Ile Gly Glu Ser Val Tyr Lys Ala Asn Ile Glu Gly Lys

Val Leu Ala Val Lys Arg Phe Lys Glu Asp Val Thr Glu Glu Leu Lys
        340   345   350

Ile Leu Gln Lys Val Asn His Gly Asn Leu Val Lys Leu Met Gly Val
        355   360   365

Ser Ser Asp Asn Asp Gly Asn Cys Phe Val Val Tyr Glu Tyr Ala Glu
    370   375   380

Asn Gly Ser Leu Asp Glu Trp Leu Phe Ser Lys Ser Cys Ser Asp Thr
385   390   395   400

Ser Asn Ser Arg Ala Ser Leu Thr Trp Cys Gln Arg Ile Ser Met Ala
            405   410   415

Val Asp Val Ala Met Gly Leu Gln Tyr Met His Glu His Ala Tyr Pro
            420   425   430

Arg Ile Val His Arg Asp Ile Thr Ser Ser Asn Ile Leu Leu Asp Ser
        435   440   445

Asn Phe Lys Ala Lys Ile Ala Asn Phe Ser Met Ala Arg Thr Phe Thr
    450   455   460

Asn Pro Met Met Pro Lys Ile Asp Val Phe Ala Phe Gly Val Val Leu
465   470   475   480

Ile Glu Leu Leu Thr Gly Arg Lys Ala Met Thr Thr Lys Glu Asn Gly
            485   490   495

Glu Val Val Met Leu Trp Lys Asp Ile Trp Lys Ile Phe Asp Gln Glu
            500   505   510

Glu Asn Arg Glu Glu Arg Leu Lys Lys Trp Met Asp Pro Lys Leu Glu
        515   520   525

Ser Tyr Tyr Pro Ile Asp Tyr Ala Leu Ser Leu Ala Ser Leu Ala Val
    530   535   540

Asn Cys Thr Ala Asp Lys Ser Leu Ser Arg Pro Thr Ile Ala Glu Ile
545   550   555   560

Val Leu Ser Leu Ser Leu Leu Thr Gln Pro Ser Pro Ala Thr Leu Glu

56

Arg Ser Leu Thr Ser Ser Gly Leu Asp Val Glu Ala Thr Gln Ile Val
          580   585   590

Thr Ser Ile Ala Ala Arg
        595

<210> 49
<211> 22
<212> DNA
<213> Lotus japonicus

<220>
<221> misc_feature
<222> (1)..(22)
<223> NPR5 extracellular domain coding sequence amplification primer

<400> 49
taattatcag agtaagtgtg ac   22

<210> 50
<211> 19
<212> DNA
<213> Lotus japonicus

<220>
<221> misc_feature
<222> (1)..(19)
<223> NPR5 extracellular domain coding sequence amplification primer

<400> 50
agttacccac ctgtggtac   19

<210> 51
<211> 2160
<212> DNA
<213> Pisum sativum

<220>
<221> 5'UTR
<222> (1)..(65)

<220>
<221> CDS
<222> (66)..(1931)

<220>
<221> 3'UTR
<222> (1932)..(2160)

<400> 51

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ttttttctgc ttcttccttt tcttcaggag ccattttgat ttgctctctt tcttattgac        60

caaat atg aaa cta aaa aat ggc tta ctc ttg ttc ttt cta ttt gtg gag        110
      Met Lys Leu Lys Asn Gly Leu Leu Leu Phe Phe Leu Phe Val Glu
      1               5                   10                  15

tgt gct ttt ttc aaa gtg gat tca aag tgt gtg aaa ggg tgt gat cta        158
Cys Ala Phe Phe Lys Val Asp Ser Lys Cys Val Lys Gly Cys Asp Leu
                20                  25                  30

gct tta gct tct tac tat gta atg cct tta gtt gaa ctc cca act ata        206
Ala Leu Ala Ser Tyr Tyr Val Met Pro Leu Val Glu Leu Pro Thr Ile
                35                  40                  45

aaa aac tat atg caa tca aag ata gtt acc aac tct tct gat gtt tta        254
Lys Asn Tyr Met Gln Ser Lys Ile Val Thr Asn Ser Ser Asp Val Leu
                50                  55                  60

aat agt tac aac aaa gtc tta gta acc aat cat ggt aat att ttt tcc        302
Asn Ser Tyr Asn Lys Val Leu Val Thr Asn His Gly Asn Ile Phe Ser
                65                  70                  75

tat ttt aga atc aac att cca ttc cca tgt gaa tgt att gga ggt gag        350
Tyr Phe Arg Ile Asn Ile Pro Phe Pro Cys Glu Cys Ile Gly Gly Glu
80                  85                  90                  95

ttc tta gga cat gtg ttt gaa tat aca aca aag aaa gga gat act tat        398
Phe Leu Gly His Val Phe Glu Tyr Thr Thr Lys Lys Gly Asp Thr Tyr
                100                 105                 110

gat ttg att gca aat aat tat tat gta agt ttg act agt gtt gag ctt        446
Asp Leu Ile Ala Asn Asn Tyr Tyr Val Ser Leu Thr Ser Val Glu Leu
                115                 120                 125

ttg aag aag ttt aac agc tat gat cca aat cat ata cct gct aag gct        494
Leu Lys Lys Phe Asn Ser Tyr Asp Pro Asn His Ile Pro Ala Lys Ala
                130                 135                 140

aag gtt aat gtt act gtg aat tgt tct tgt ggg aat agc cag att tca        542
Lys Val Asn Val Thr Val Asn Cys Ser Cys Gly Asn Ser Gln Ile Ser
        145                 150                 155

aaa gat tat ggc ttg ttt gtt act tat ccg tta agg tct acg gat tct        590
Lys Asp Tyr Gly Leu Phe Val Thr Tyr Pro Leu Arg Ser Thr Asp Ser
160                 165                 170                 175

ctt gag aag att gcg aac gag tcg aaa ctt gat gaa ggg ttg ata cag        638
Leu Glu Lys Ile Ala Asn Glu Ser Lys Leu Asp Glu Gly Leu Ile Gln
                180                 185                 190

aat ttc aac cct gat gtc aat ttc agt aga gga agt ggg ata gtg ttc        686
Asn Phe Asn Pro Asp Val Asn Phe Ser Arg Gly Ser Gly Ile Val Phe
                195                 200                 205

att cca gga aga gat aaa aat gga gaa tat gtt cct ttg tat cct aaa        734
Ile Pro Gly Arg Asp Lys Asn Gly Glu Tyr Val Pro Leu Tyr Pro Lys
                210                 215                 220

aca ggt gtt ggt aag ggt gta gct att ggt ata tct ata gca gga gta        782
Thr Gly Val Gly Lys Gly Val Ala Ile Gly Ile Ser Ile Ala Gly Val
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58

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ttt gcg gtt ctg tta ttt gtt atc tgt ata tat gtc aaa tac ttc cag        830
Phe Ala Val Leu Leu Phe Val Ile Cys Ile Tyr Val Lys Tyr Phe Gln
240                 245                 250                 255

aaa aag gaa gaa gag aaa act ata ctg ccc caa gtt tct aag gcg ctt        878
Lys Lys Glu Glu Glu Lys Thr Ile Leu Pro Gln Val Ser Lys Ala Leu
                    260                 265                 270

tcg act caa gat ggt aat gcc tcg agt agt gga gaa tat gaa act tca        926
Ser Thr Gln Asp Gly Asn Ala Ser Ser Ser Gly Glu Tyr Glu Thr Ser
                275                 280                 285

gga tct agt ggg cat ggt act ggt agt gct gca ggc ctc aca gga atc        974
Gly Ser Ser Gly His Gly Thr Gly Ser Ala Ala Gly Leu Thr Gly Ile
                290                 295                 300

atg gtg gca aag tca act gag ttt tca tat caa gag cta gcc aag gct       1022
Met Val Ala Lys Ser Thr Glu Phe Ser Tyr Gln Glu Leu Ala Lys Ala
                305                 310                 315

aca gat aac ttt agt ttg gat aat aaa atc ggt caa ggt gga ttt gga       1070
Thr Asp Asn Phe Ser Leu Asp Asn Lys Ile Gly Gln Gly Gly Phe Gly
320                 325                 330                 335

gct gtc tat tat gca gaa ctc aga ggc gag aaa aca gca atc aag aag       1118
Ala Val Tyr Tyr Ala Glu Leu Arg Gly Glu Lys Thr Ala Ile Lys Lys
                340                 345                 350

atg aat gtg caa gca tca tca gaa ttt ctg tgt gag ttg aag gtc tta       1166
Met Asn Val Gln Ala Ser Ser Glu Phe Leu Cys Glu Leu Lys Val Leu
                355                 360                 365

acg cac gtt cat cat ttg aat ctg gtg agg ttg att gga tat tgc gtt       1214
Thr His Val His His Leu Asn Leu Val Arg Leu Ile Gly Tyr Cys Val
                370                 375                 380

gag ggg tcg ctt ttc ctt gtc tat gaa cat att gac aat gga aac ttg       1262
Glu Gly Ser Leu Phe Leu Val Tyr Glu His Ile Asp Asn Gly Asn Leu
                385                 390                 395

ggt caa tat ttg cat ggt aaa gat aaa gag cca tta cca tgg tct agt       1310
Gly Gln Tyr Leu His Gly Lys Asp Lys Glu Pro Leu Pro Trp Ser Ser
400                 405                 410                 415

aga gtc caa att gct cta gat tca gca cga ggc ctt gaa tac att cat       1358
Arg Val Gln Ile Ala Leu Asp Ser Ala Arg Gly Leu Glu Tyr Ile His
                420                 425                 430

gaa cat acc gtg cct gtg tat atc cat cgc gat gta aaa tca gca aac       1406
Glu His Thr Val Pro Val Tyr Ile His Arg Asp Val Lys Ser Ala Asn
                435                 440                 445

ata ttg ata gac aaa aac ttg cgc gga aag gtt gca gat ttt ggc ttg       1454
Ile Leu Ile Asp Lys Asn Leu Arg Gly Lys Val Ala Asp Phe Gly Leu
                450                 455                 460

acc aaa ctt att gaa gtt gga aat tcc aca ctt cac act cgt ctt gtt       1502
Thr Lys Leu Ile Glu Val Gly Asn Ser Thr Leu His Thr Arg Leu Val
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59

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              465                    470                    475

gga act ttt gga tac atg cca cca gaa tat gct caa tat ggt gac gtt    1550
Gly Thr Phe Gly Tyr Met Pro Pro Glu Tyr Ala Gln Tyr Gly Asp Val
480                  485                  490                  495

tct ccg aaa ata gac gta tat gct ttt gga gtt gtt ctt tat gaa ctg    1598
Ser Pro Lys Ile Asp Val Tyr Ala Phe Gly Val Val Leu Tyr Glu Leu
                 500                  505                  510

ata tct gca aag aat gct gtt ctg aag aca ggt gaa gaa tct gtt gct    1646
Ile Ser Ala Lys Asn Ala Val Leu Lys Thr Gly Glu Glu Ser Val Ala
                 515                  520                  525

gaa tca aag ggt ctt gta gcc ttg ttt gaa aaa gca ctt aat cag att    1694
Glu Ser Lys Gly Leu Val Ala Leu Phe Glu Lys Ala Leu Asn Gln Ile
             530                  535                  540

gat cct tca gaa gct ctt cgc aaa ttg gtg gat cct agg ctt aaa gaa    1742
Asp Pro Ser Glu Ala Leu Arg Lys Leu Val Asp Pro Arg Leu Lys Glu
         545                  550                  555

aac tat cca att gat tct gtt tta aag atg gct caa ctt ggg aga gca    1790
Asn Tyr Pro Ile Asp Ser Val Leu Lys Met Ala Gln Leu Gly Arg Ala
560                  565                  570                  575

tgt aca aga gat aat cca cta cta cgc cca agt atg aga tct tta gtt    1838
Cys Thr Arg Asp Asn Pro Leu Leu Arg Pro Ser Met Arg Ser Leu Val
                 580                  585                  590

gtt gat ctt atg aca ctg tca tca cca ttt gaa gat tgt gat gat gac    1886
Val Asp Leu Met Thr Leu Ser Ser Pro Phe Glu Asp Cys Asp Asp Asp
             595                  600                  605

act tcc tat gaa aat caa act ctc ata aat cta ttg tca gtg aga        1931
Thr Ser Tyr Glu Asn Gln Thr Leu Ile Asn Leu Leu Ser Val Arg
         610                  615                  620

tgaaggttct ttgtgccaga ttgaatgatg tttgttaaaa ctgaactagt tgggaagttt    1991

tttactttgt gttcaaagtt tatttcccaa aatgttcaaa aggtcctaga tttcaaaaag    2051

acatcctgta attattttta gtgaagttgt aacactgaag tacaatttgt attatgatgt    2111

gaaaacttta tttttgcttt caaaatgtac ataagataag attctaaac              2160


<210>  52
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<212>  PRT
<213>  Pisum sativum

<400>  52

Met Lys Leu Lys Asn Gly Leu Leu Leu Phe Phe Leu Phe Val Glu Cys
1                   5                   10                  15


Ala Phe Phe Lys Val Asp Ser Lys Cys Val Lys Gly Cys Asp Leu Ala
              20                  25                  30
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60

```
Leu Ala Ser Tyr Tyr Val Met Pro Leu Val Glu Leu Pro Thr Ile Lys
        35              40                  45


Asn Tyr Met Gln Ser Lys Ile Val Thr Asn Ser Ser Asp Val Leu Asn
        50              55                  60


Ser Tyr Asn Lys Val Leu Val Thr Asn His Gly Asn Ile Phe Ser Tyr
65                  70                  75                  80


Phe Arg Ile Asn Ile Pro Phe Pro Cys Glu Cys Ile Gly Gly Glu Phe
                85              90                  95


Leu Gly His Val Phe Glu Tyr Thr Thr Lys Lys Gly Asp Thr Tyr Asp
                100             105                 110


Leu Ile Ala Asn Asn Tyr Tyr Val Ser Leu Thr Ser Val Glu Leu Leu
        115             120                 125


Lys Lys Phe Asn Ser Tyr Asp Pro Asn His Ile Pro Ala Lys Ala Lys
        130             135                 140


Val Asn Val Thr Val Asn Cys Ser Cys Gly Asn Ser Gln Ile Ser Lys
145                 150                 155                 160


Asp Tyr Gly Leu Phe Val Thr Tyr Pro Leu Arg Ser Thr Asp Ser Leu
                165                 170                 175


Glu Lys Ile Ala Asn Glu Ser Lys Leu Asp Glu Gly Leu Ile Gln Asn
                180             185                 190


Phe Asn Pro Asp Val Asn Phe Ser Arg Gly Ser Gly Ile Val Phe Ile
                195             200                 205


Pro Gly Arg Asp Lys Asn Gly Glu Tyr Val Pro Leu Tyr Pro Lys Thr
        210             215                 220


Gly Val Gly Lys Gly Val Ala Ile Gly Ile Ser Ile Ala Gly Val Phe
225                 230                 235                 240


Ala Val Leu Leu Phe Val Ile Cys Ile Tyr Val Lys Tyr Phe Gln Lys
                245             250                 255


Lys Glu Glu Glu Lys Thr Ile Leu Pro Gln Val Ser Lys Ala Leu Ser
            260             265                 270
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Thr Gln Asp Gly Asn Ala Ser Ser Ser Gly Glu Tyr Glu Thr Ser Gly
        275                 280                 285

Ser Ser Gly His Gly Thr Gly Ser Ala Ala Gly Leu Thr Gly Ile Met
    290                 295                 300

Val Ala Lys Ser Thr Glu Phe Ser Tyr Gln Glu Leu Ala Lys Ala Thr
305                 310                 315                 320

Asp Asn Phe Ser Leu Asp Asn Lys Ile Gly Gln Gly Gly Phe Gly Ala
            325                 330                 335

Val Tyr Tyr Ala Glu Leu Arg Gly Glu Lys Thr Ala Ile Lys Lys Met
            340                 345                 350

Asn Val Gln Ala Ser Ser Glu Phe Leu Cys Glu Leu Lys Val Leu Thr
        355                 360                 365

His Val His His Leu Asn Leu Val Arg Leu Ile Gly Tyr Cys Val Glu
    370                 375                 380

Gly Ser Leu Phe Leu Val Tyr Glu His Ile Asp Asn Gly Asn Leu Gly
385                 390                 395                 400

Gln Tyr Leu His Gly Lys Asp Lys Glu Pro Leu Pro Trp Ser Ser Arg
            405                 410                 415

Val Gln Ile Ala Leu Asp Ser Ala Arg Gly Leu Glu Tyr Ile His Glu
            420                 425                 430

His Thr Val Pro Val Tyr Ile His Arg Asp Val Lys Ser Ala Asn Ile
            435                 440                 445

Leu Ile Asp Lys Asn Leu Arg Gly Lys Val Ala Asp Phe Gly Leu Thr
    450                 455                 460

Lys Leu Ile Glu Val Gly Asn Ser Thr Leu His Thr Arg Leu Val Gly
465                 470                 475                 480

Thr Phe Gly Tyr Met Pro Pro Glu Tyr Ala Gln Tyr Gly Asp Val Ser
            485                 490                 495

Pro Lys Ile Asp Val Tyr Ala Phe Gly Val Val Leu Tyr Glu Leu Ile
            500                 505                 510
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Ser Ala Lys Asn Ala Val Leu Lys Thr Gly Glu Glu Ser Val Ala Glu
        515                 520                 525

Ser Lys Gly Leu Val Ala Leu Phe Glu Lys Ala Leu Asn Gln Ile Asp
    530                 535                 540

Pro Ser Glu Ala Leu Arg Lys Leu Val Asp Pro Arg Leu Lys Glu Asn
545                 550                 555                 560

Tyr Pro Ile Asp Ser Val Leu Lys Met Ala Gln Leu Gly Arg Ala Cys
                565                 570                 575

Thr Arg Asp Asn Pro Leu Leu Arg Pro Ser Met Arg Ser Leu Val Val
            580                 585                 590

Asp Leu Met Thr Leu Ser Ser Pro Phe Glu Asp Cys Asp Asp Asp Thr
        595                 600                 605

Ser Tyr Glu Asn Gln Thr Leu Ile Asn Leu Leu Ser Val Arg
    610                 615                 620


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<212>  DNA
<213>  Pisum sativum


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<222>  (1)..(140)

<220>
<221>  CDS
<222>  (141)..(1991)

<220>
<221>  3'UTR
<222>  (1992)..(2217)

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attcggcacg agattttcaa gaaatgaatt ttgtactaca tattaatcat tcgttgctga      60

tttgagttaa tttctttttc tgcttcttgc tttccttcgg cagccatttt gtgatttttt     120

ctctttccct tattgattca atg aaa ctc aaa aat ggg tta ctg ctg ttc ttt     173
                        Met Lys Leu Lys Asn Gly Leu Leu Leu Phe Phe
                         1                 5                 10

atg ttt ctg gat tgt att ttt ttc aaa gtg gaa tcc aag tgt gta ata     221
Met Phe Leu Asp Cys Ile Phe Phe Lys Val Glu Ser Lys Cys Val Ile
            15                  20                  25
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ggg tgt gat ata gct tta gct tcc tac tat gta atg cct tta gtt caa      269
Gly Cys Asp Ile Ala Leu Ala Ser Tyr Tyr Val Met Pro Leu Val Gln
        30              35              40

ctc tcc aat ata aca acc ttt atg caa tca aag ctt gtt acc aat tct      317
Leu Ser Asn Ile Thr Thr Phe Met Gln Ser Lys Leu Val Thr Asn Ser
        45              50              55

ttt gag gtt ata gta agg tac aac aga gac att gtg ttc agt aat gat      365
Phe Glu Val Ile Val Arg Tyr Asn Arg Asp Ile Val Phe Ser Asn Asp
60              65              70              75

aat ctt ttt tcc tat ttt aga gtc aac att cca ttc cca tgt gaa tgt      413
Asn Leu Phe Ser Tyr Phe Arg Val Asn Ile Pro Phe Pro Cys Glu Cys
            80              85              90

att gga ggt gaa ttt ctt ggg cat gtg ttt gaa tac act gca aat gaa      461
Ile Gly Gly Glu Phe Leu Gly His Val Phe Glu Tyr Thr Ala Asn Glu
            95              100             105

ggc gat act tat gat tta att gca aat acc tat tat gca agc tta aca      509
Gly Asp Thr Tyr Asp Leu Ile Ala Asn Thr Tyr Tyr Ala Ser Leu Thr
        110             115             120

act gtt gag gtt ttg aaa aag tac aac agc tat gat cca aat cat ata      557
Thr Val Glu Val Leu Lys Lys Tyr Asn Ser Tyr Asp Pro Asn His Ile
        125             130             135

cct gtc aaa gct aag gtt aat gtc act gtt aat tgt tct tgt ggg aac      605
Pro Val Lys Ala Lys Val Asn Val Thr Val Asn Cys Ser Cys Gly Asn
140             145             150             155

agc cag att tca aaa gac tat ggg cta ttt atc acc tat cca ctt agg      653
Ser Gln Ile Ser Lys Asp Tyr Gly Leu Phe Ile Thr Tyr Pro Leu Arg
            160             165             170

cct agg gat act ctt gag aag att gca aga cat tct aat ctt gat gaa      701
Pro Arg Asp Thr Leu Glu Lys Ile Ala Arg His Ser Asn Leu Asp Glu
        175             180             185

gga gta ata caa agt tac aat ttg ggt gtc aat ttc agc aaa ggc agc      749
Gly Val Ile Gln Ser Tyr Asn Leu Gly Val Asn Phe Ser Lys Gly Ser
        190             195             200

ggg gta gtg ttc ttt ccc gga aga gat aaa aat gga gaa tat gtt cct      797
Gly Val Val Phe Phe Pro Gly Arg Asp Lys Asn Gly Glu Tyr Val Pro
        205             210             215

tta tat cct aga aca ggt ctt ggt aag ggt gca gct gct ggt ata tct      845
Leu Tyr Pro Arg Thr Gly Leu Gly Lys Gly Ala Ala Ala Gly Ile Ser
220             225             230             235

ata gct gga ata ttt gcg ctt ctg tta ttt gtt atc tgc ata tat atc      893
Ile Ala Gly Ile Phe Ala Leu Leu Leu Phe Val Ile Cys Ile Tyr Ile
            240             245             250

aaa tac ttc caa aag aag gaa gaa gag aaa act aaa ctg cca caa gtt      941
Lys Tyr Phe Gln Lys Lys Glu Glu Glu Lys Thr Lys Leu Pro Gln Val
        255             260             265
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64

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tct acg gcg ctt tca gct caa gat gcc tcg ggt agt gga gag tac gaa          989
Ser Thr Ala Leu Ser Ala Gln Asp Ala Ser Gly Ser Gly Glu Tyr Glu
        270             275             280

act tcg gga tcc agt ggg cat ggt acc ggt agt act gct ggc ctt aca          1037
Thr Ser Gly Ser Ser Gly His Gly Thr Gly Ser Thr Ala Gly Leu Thr
        285             290             295

gga att atg gtg gca aag tca act gag ttt tca tat caa gaa cta gcc          1085
Gly Ile Met Val Ala Lys Ser Thr Glu Phe Ser Tyr Gln Glu Leu Ala
300             305             310             315

aag gct aca aat aac ttc agc tta gat aat aaa att ggt caa ggt gga          1133
Lys Ala Thr Asn Asn Phe Ser Leu Asp Asn Lys Ile Gly Gln Gly Gly
                320             325             330

ttt gga gct gtc tat tat gca gta ctc aga ggc gag aaa aca gca att          1181
Phe Gly Ala Val Tyr Tyr Ala Val Leu Arg Gly Glu Lys Thr Ala Ile
            335             340             345

aag aag atg gat gta caa gcg tca aca gaa ttc ctt tgc gag ttg caa          1229
Lys Lys Met Asp Val Gln Ala Ser Thr Glu Phe Leu Cys Glu Leu Gln
            350             355             360

gtc tta aca cat gtt cat cac ttg aat ctg gtg agg ttg att gga tat          1277
Val Leu Thr His Val His His Leu Asn Leu Val Arg Leu Ile Gly Tyr
        365             370             375

tgt gtt gag gga tca ctt ttc ctt gta tat gaa cat att gac aat gga          1325
Cys Val Glu Gly Ser Leu Phe Leu Val Tyr Glu His Ile Asp Asn Gly
380             385             390             395

aac ttg ggt caa tat ttg cac ggt ata gat aaa gcg cca tta cca tgg          1373
Asn Leu Gly Gln Tyr Leu His Gly Ile Asp Lys Ala Pro Leu Pro Trp
                400             405             410

tca agt agg gtg caa att gct cta gat tcc gca aga ggc ctt gaa tac          1421
Ser Ser Arg Val Gln Ile Ala Leu Asp Ser Ala Arg Gly Leu Glu Tyr
            415             420             425

att cat gaa cac act gta cct gtg tat atc cat cgt gat gta aaa tca          1469
Ile His Glu His Thr Val Pro Val Tyr Ile His Arg Asp Val Lys Ser
        430             435             440

gcg aat ata tta ata gac aaa aac ttg cac gga aag gtt gca gat ttt          1517
Ala Asn Ile Leu Ile Asp Lys Asn Leu His Gly Lys Val Ala Asp Phe
        445             450             455

ggc ttg acc aaa ctt att gaa gtt gga aac tcc aca ctt cac act cgt          1565
Gly Leu Thr Lys Leu Ile Glu Val Gly Asn Ser Thr Leu His Thr Arg
460             465             470             475

cta gtg gga aca ttt gga tac atg cca cca gaa tat gct caa tat ggc          1613
Leu Val Gly Thr Phe Gly Tyr Met Pro Pro Glu Tyr Ala Gln Tyr Gly
                480             485             490

gat gtt tct cca aaa ata gat gta tat gct ttt gga gtt gtt ctt tat          1661
Asp Val Ser Pro Lys Ile Asp Val Tyr Ala Phe Gly Val Val Leu Tyr
                495             500             505
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65

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gag ctt att tct gca aag aat gct att ctg aag aca ggt gaa tct gct      1709
Glu Leu Ile Ser Ala Lys Asn Ala Ile Leu Lys Thr Gly Glu Ser Ala
        510             515             520

gtc gaa tca aag ggt ctt gta gca ttg ttt gaa gaa gca ctt aat cag      1757
Val Glu Ser Lys Gly Leu Val Ala Leu Phe Glu Glu Ala Leu Asn Gln
        525             530             535

atc gat cct tta gaa gct ctt cgc aaa ttg gtg gat cct agg ctt aaa      1805
Ile Asp Pro Leu Glu Ala Leu Arg Lys Leu Val Asp Pro Arg Leu Lys
540             545             550             555

gaa aac tat cca att gat tct gtt tta aag atg gct caa ctt ggg aga      1853
Glu Asn Tyr Pro Ile Asp Ser Val Leu Lys Met Ala Gln Leu Gly Arg
            560             565             570

gca tgt aca aga gac aat cca cta cta cgc cca agt atg aga tct tta      1901
Ala Cys Thr Arg Asp Asn Pro Leu Leu Arg Pro Ser Met Arg Ser Leu
            575             580             585

gtc gtt gct ctt atg aca ctc tta tca cat act gat gat gat gac act      1949
Val Val Ala Leu Met Thr Leu Leu Ser His Thr Asp Asp Asp Asp Thr
        590             595             600

ttc tat gaa aat caa tct ctc aca aat cta tta tca gtg aga              1991
Phe Tyr Glu Asn Gln Ser Leu Thr Asn Leu Leu Ser Val Arg
        605             610             615

tgaaggcttt gtgtgccaaa ttgaatgatg tttgtgaaaa cttttagaag catacagcaa    2051

aatgtttgta ctctgaacat aatattgagg ttaggaagtt ttgatcttgt gttcaaattt    2111

tatttcccaa aatagtcaaa aagtcctaga tccaaagaag acatcctgta attattttta    2171

gtgacgctgt aacactaaag tacagtttat atataacatt ttaaaa                   2217


<210>   54
<211>   617
<212>   PRT
<213>   Pisum sativum

<400>   54

Met Lys Leu Lys Asn Gly Leu Leu Leu Phe Phe Met Phe Leu Asp Cys
1                   5                   10                  15


Ile Phe Phe Lys Val Glu Ser Lys Cys Val Ile Gly Cys Asp Ile Ala
                20                  25                  30


Leu Ala Ser Tyr Tyr Val Met Pro Leu Val Gln Leu Ser Asn Ile Thr
            35                  40                  45


Thr Phe Met Gln Ser Lys Leu Val Thr Asn Ser Phe Glu Val Ile Val
        50                  55                  60
```

66

```
Arg Tyr Asn Arg Asp Ile Val Phe Ser Asn Asp Asn Leu Phe Ser Tyr
65              70              75              80


Phe Arg Val Asn Ile Pro Phe Pro Cys Glu Cys Ile Gly Gly Glu Phe
                85              90              95


Leu Gly His Val Phe Glu Tyr Thr Ala Asn Glu Gly Asp Thr Tyr Asp
            100             105             110


Leu Ile Ala Asn Thr Tyr Tyr Ala Ser Leu Thr Thr Val Glu Val Leu
            115             120             125


Lys Lys Tyr Asn Ser Tyr Asp Pro Asn His Ile Pro Val Lys Ala Lys
    130             135             140


Val Asn Val Thr Val Asn Cys Ser Cys Gly Asn Ser Gln Ile Ser Lys
145             150             155             160


Asp Tyr Gly Leu Phe Ile Thr Tyr Pro Leu Arg Pro Arg Asp Thr Leu
            165             170             175


Glu Lys Ile Ala Arg His Ser Asn Leu Asp Glu Gly Val Ile Gln Ser
            180             185             190


Tyr Asn Leu Gly Val Asn Phe Ser Lys Gly Ser Gly Val Val Phe Phe
        195             200             205


Pro Gly Arg Asp Lys Asn Gly Glu Tyr Val Pro Leu Tyr Pro Arg Thr
    210             215             220


Gly Leu Gly Lys Gly Ala Ala Ala Gly Ile Ser Ile Ala Gly Ile Phe
225             230             235             240


Ala Leu Leu Leu Phe Val Ile Cys Ile Tyr Ile Lys Tyr Phe Gln Lys
            245             250             255


Lys Glu Glu Glu Lys Thr Lys Leu Pro Gln Val Ser Thr Ala Leu Ser
        260             265             270


Ala Gln Asp Ala Ser Gly Ser Gly Glu Tyr Glu Thr Ser Gly Ser Ser
        275             280             285


Gly His Gly Thr Gly Ser Thr Ala Gly Leu Thr Gly Ile Met Val Ala
        290             295             300
```

67

```
Lys Ser Thr Glu Phe Ser Tyr Gln Glu Leu Ala Lys Ala Thr Asn Asn
305             310             315             320


Phe Ser Leu Asp Asn Lys Ile Gly Gln Gly Gly Phe Gly Ala Val Tyr
            325             330             335


Tyr Ala Val Leu Arg Gly Glu Lys Thr Ala Ile Lys Lys Met Asp Val
        340             345             350


Gln Ala Ser Thr Glu Phe Leu Cys Glu Leu Gln Val Leu Thr His Val
        355             360             365


His His Leu Asn Leu Val Arg Leu Ile Gly Tyr Cys Val Glu Gly Ser
    370             375             380


Leu Phe Leu Val Tyr Glu His Ile Asp Asn Gly Asn Leu Gly Gln Tyr
385             390             395             400


Leu His Gly Ile Asp Lys Ala Pro Leu Pro Trp Ser Ser Arg Val Gln
            405             410             415


Ile Ala Leu Asp Ser Ala Arg Gly Leu Glu Tyr Ile His Glu His Thr
        420             425             430


Val Pro Val Tyr Ile His Arg Asp Val Lys Ser Ala Asn Ile Leu Ile
        435             440             445


Asp Lys Asn Leu His Gly Lys Val Ala Asp Phe Gly Leu Thr Lys Leu
    450             455             460


Ile Glu Val Gly Asn Ser Thr Leu His Thr Arg Leu Val Gly Thr Phe
465             470             475             480


Gly Tyr Met Pro Pro Glu Tyr Ala Gln Tyr Gly Asp Val Ser Pro Lys
            485             490             495


Ile Asp Val Tyr Ala Phe Gly Val Val Leu Tyr Glu Leu Ile Ser Ala
        500             505             510


Lys Asn Ala Ile Leu Lys Thr Gly Glu Ser Ala Val Glu Ser Lys Gly
    515             520             525


Leu Val Ala Leu Phe Glu Glu Ala Leu Asn Gln Ile Asp Pro Leu Glu
    530             535             540
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Ala Leu Arg Lys Leu Val Asp Pro Arg Leu Lys Glu Asn Tyr Pro Ile
545             550             555             560


Asp Ser Val Leu Lys Met Ala Gln Leu Gly Arg Ala Cys Thr Arg Asp
                565             570             575


Asn Pro Leu Leu Arg Pro Ser Met Arg Ser Leu Val Val Ala Leu Met
                580             585             590


Thr Leu Leu Ser His Thr Asp Asp Asp Thr Phe Tyr Glu Asn Gln
        595             600             605


Ser Leu Thr Asn Leu Leu Ser Val Arg
    610             615
```